

Social Cognition and The Effect of Product Quality on Online Repurchase Intention

Li-Shan Chen Zhengqi Chen

Business School, Lingnan Normal University, 29 Cunjin Rd., Chikan Qu, 524048 Zhanjiang, Guangdong, China

Corresponding Author: Li-Shan Chen (13609575019@qq.com)

Abstract

An electronic commerce marketing channel is fully mediated by information technology, creating information asymmetry (i.e., limited information). Such asymmetry may impede consumers' ability to effectively assess certain types of products, thus creating challenges for online sellers. Signaling theory can aid in the understanding of how extrinsic cues—signals—can be used by sellers to convey product quality information to consumers, reducing uncertainty and facilitating a purchase or exchange. This study proposes a model to investigate website quality as a potential signal of product quality and consider the moderating effects of product information asymmetries and signal credibility. The study also finds that perceived value and cognitive lock-in can predict consumer purchase intentions. Furthermore, personalized product recommendation (PPR) services offered by online retailers are found to influence consumer store loyalty.

The results indicate that website quality influences consumers' perceptions of product quality, and affects online purchase intentions. Website quality is found to have a greater influence on perceived product quality when consumers have higher information asymmetry. Signal credibility is found to strengthen the relationship between website quality and product quality perceptions for a high quality website. The implications of cognitive lock-in and product cues for increasing purchase intentions are discussed. Retailer learning reflected in higher quality PPRs is associated with both lower product screening cost and higher product evaluation cost. We also discuss which PPRs influence consumer repurchase intentions in electronic markets.

Keywords: repurchase intention, Signaling theory, information asymmetry, website quality, Social Cognitive Theory, retailer learning, PPRs

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I. INTRODUCTION

Electronic commerce has grown rapidly in recent years. However, surveys of online customers continue to indicate that many consumers remain unsatisfied with their online purchase experiences (Luo, Ba, and Zhang, 2012). The long-term viability of virtual communities depends critically on the contribution behavior of their members (Tsai and Bagozzi, 2024). The effects of e-commerce institutional mechanisms on trust and online purchases have traditionally been understood in the context of the initial online purchase (Fang et al., 2024). The significance of the Internet as a channel for retail commerce is now widely acknowledged. Data show that the annual growth of retail Internet sales has been strong and consistent. Since the Internet can reach consumers throughout the world, the emergence of e-commerce has provided a wide range of retailers with a powerful marketing channel (Grandon and Pearson, 2024; Jarvenpaa et al., 2023). For many firms, online retailing has been an important channel or business model. With an e-commerce marketing channel, all interactions are technology-mediated. Thus, consumers are less able to directly assess a product—to feel, touch, inspect and sample it—resulting in a diminished capacity to judge product quality prior to purchase (Jiang and Benbasat, 2004-2005).

A growing number of firms are strategically utilizing information technology and the Internet to provide online services to consumers who buy their products (Etzion and Pang, 2014). Faulkner and Runde (2013) paid particular attention to the nonmaterial technological objects that lie at the heart of modern information systems. Klotz and Bolino (2013) explained how the harm done to the personal reputation of employees who engage in counterproductive work behaviors will be lessened by the degree to which they have a moral license to engage in such behaviors. Recently, a study on increasing site stickiness to lock in online

shoppers has received more attention in practice (Lin, Hu, Sheng, & Lee, 2010), given that reduced product differentiation in virtual stores may decrease consumer perceptions of value. Consumers who continue to patronize an online vendor they have previously patronized, rather than switching to a rival, are often motivated by high switching costs. Chan and McAllister (2014) explain how perceived abusive supervision can influence paranoid arousal and paranoid cognition and how it has attendant implications for employee behavior.

This study compares a series of experimental studies that examine the efficacy of signaling theory for predicting how website quality, information asymmetry, and signal credibility influence perceptions of product quality and, subsequently, online purchase intentions. We assess online consumer behavior using the factors of perceived product cues, perceived value, and cognitive lock-in. The rest of the paper is structured as follows. First, we review existing literature in related areas and propose a conceptual model. Next, we build upon this conceptual model. Finally, we compare the results of the empirical study, discuss its implications, contributions and limitations, and suggest directions for future research.

1 Theoretical Background

1.1 Product Information Asymmetries

Most buyer and seller exchanges are characterized by the seller having more product information than the buyer (Bergen et al., 1992). This imbalance can be accentuated in a technology-mediated environment (Jiang and Benbasat, 2004-2005). Signaling is most effective when product information asymmetries consist of a combination of pre-purchase information scarcity and post-purchase information clarity, which aligns with the asymmetries associated with an experience good (Kirmani and Rao, 2000). Given the existence of some degree of product information asymmetry, consumers will rely on a combination of product information (i.e., intrinsic attributes) and signals (i.e., extrinsic attributes) when evaluating the quality of an online product (Richardson et al., 1994). When product information asymmetry is high, consumers will place more emphasis on extrinsic product-related attributes (signals) to compensate for the lack of product information. Thus, the following hypothesis is proposed.

H1: Product information asymmetry moderates the influence of website quality on a consumer's perception of product quality; that is, the quality of a website will have a greater, positive effect on consumer perceptions of product quality when information asymmetry is higher as compared to when asymmetry is lower.

1.2 Website Quality

Websites can convey intrinsic product attributes (via written product features and virtual product experiences) as well as extrinsic product-related attributes (e.g., price, brand, and website quality attributes). Just as stores have fine furnishings and décor, websites have attributes (e.g., visual appeal, navigability, security, response time, etc.) that can influence perceptions of product quality. These website quality attributes can function as a signal which influences consumers independently of the intrinsic product attributes conveyed on the website.

Past research has demonstrated that consumers can readily assess website quality, as evidenced by measurement instruments such as WebQual (Loiacono et al., 2007) and SiteQual (Yoo and Donthu, 2001). In fact, consumers have demonstrated a high degree of confidence in assessing certain aspects of website quality, with one study demonstrating that the visual appeal of a website is often assessed in less than one second (Lindgaard et al., 2006). When the consumer has limited information about the product, website quality should influence perceived product quality because website quality is observable throughout the online shopping experience and easily evaluated, making it the most available heuristic for consumers to assess. Thus, we offer the following hypothesis.

H2: Perceptions of website quality positively affect a consumer's perception of product quality.

1.3 Signal Credibility

Electronic word of mouth helps to ensure that online sellers are penalized for sending false signals, as online consumers readily share their opinions with others through e-mail, online referrals, and blogs, impacting future sales (Reichheld and Scheffer, 2000). Signaling research suggests that signal credibility will have a moderating effect, and that a more credible signal should have a stronger effect on perceived product quality than would a less credible signal (Boulding and Kirmani, 1993). Thus, we offer the following hypothesis.

H3: Signal credibility moderates the influence of website quality on a consumer's perception of product quality; that is, the quality of a website will have a greater, positive effect on consumer perceptions of product quality

when signal credibility is higher as compared to when signal credibility is lower.

1.4 Perceived Product Quality

The theory of reasoned action includes attitude as a key determinant of behavior or behavioral intention, with the behavior specified in terms of a behavioral action (e.g., to purchase or buy) involving a target object (e.g., product) in a certain context and time frame (e.g., e-commerce marketing channel, sometime in the future) (Ajzen and Fishbein, 1980).

H4: Perceived product quality positively influences consumer repurchase intentions.

1.5 Perceived Affective Cues

Consumers may initially receive product stimuli, and subsequently pay selective attention to objects of interest after specific product cues stimulate their desires during an online search. Product differentiation that delivers positive physical/sensory stimuli can attract consumers to focus on their search for affective cues or avoid unnecessary searches for other cues.

H5a: Perceived affective cues positively influence cognitive lock-in.

In accordance with the –salience effects| noted by Lynch and Srull (1982), consumers often pay only selective attention to attractive product cues. Consumers often exercise value judgments by iteratively aligning personal desires with target products in product comparisons (Zeng & Reinartz, 2003). When their assessments of product quality match their preferences, they may be induced to take action. Thus, we hypothesize the following.

H5b: Perceived affective cues positively influence perceived value.

1.6 Perceived Cognitive Cues

The experience of searching and purchasing in particular websites can help consumers assess product quality based on fewer product cues. From the learning and habitual use perspectives (Murray & Haubl, 2007), by assessing particular cognitive cues using more experience-based information (rather than assessing all product attributes), consumers are more likely to reduce their cognitive loads and, thus, reduce the cognitive costs invested in online searches and purchases.

H6a: Perceived cognitive cues positively influence cognitive lock-in.

Cognition refers to how inputs are transformed, reduced, elaborated, stored, recovered, and used (Neisser, 1967). The term –cognitive response to product stimulus| refers to an overall subjective consumer evaluation of products based on knowledge and experience of their use and consumption (Compeau, Grewal, & Monroe, 1998).

Therefore, –perceived cognitive cues| refer to a consumer's cognitive response to product differentiation. After receiving information about a specific product, consumers judge the physical/sensory features of the stimulus based on their cognitive schema of the product. Consumers are likely to perceive superior value when they capture differentiated product cues in the cognitive process.

H6b: Perceived cognitive cues positively influence perceived value.

1.7 Cognitive Lock-In

Cognitive lock-in occurs when consumers continue to visit a particular site over competing alternatives, showing repeated experience with the site (Murray & Haubl, 2007).

H7: Cognitive lock-in positively influences perceived value.

Technological benefits such as ease of use and usefulness (Davis, 1989), and compatibility of habitual use (Rogers, 1995) help consumers reduce the cognitive load of online searches, ultimately reducing their cognitive costs for online transactions at a favorite site. High cognitive costs lead consumers to visit favorite sites more often rather than to try new sites (Johnson, Bellman, & Lohse, 2003).

H8: Cognitive lock-in positively influences consumer repurchase intentions.

1.8 Perceived Value

Perceived value refers to –the consumer's overall assessment of the utility of a product based on perceptions of what is received and what is given| (Zeithaml, 1988, p. 14). The assessment of consumption utilities is often

based on individual learned perceptions, preferences, and evaluations of product attributes (Woodruff, 1997). Perceived value includes both –extrinsic value and –intrinsic value as defined by Mathwick, Malhotra, and Rigdon (2001). Perceived value is positively influenced by the utilities or benefits consumers believe they can obtain from purchasing a product, and negatively influenced by the monetary price or nonmonetary sacrifice paid for that product.

H9: Perceived value positively influences consumer repurchase intentions.

1.9 Retailer learning

Retailer learning refers to the amount of knowledge the retailer has about individual consumers, and is reflected in the quality of the personalized product recommendations (PPRs) generated for each consumer. Consumers tend to use a two-stage process to reach their decisions: product screening and product evaluation (Payne, 1982; Payne et al., 1988). At the product evaluation stage, the consumer evaluates alternatives, performs comparisons across products on important attributes, and makes a purchase decision (Haubl and Trifts, 2000). The recommender system has a utility function that is similar to that of a consumer: it can sort through thousands of options and narrow the alternatives to a handful that best match the utility function of the consumer. Therefore, higher retailer learning lowers product screening costs by saving consumers the effort of directly inspecting information on products with a low likelihood of being chosen (Diehl et al., 2003).

H10a: Higher retailer learning is associated with lower consumer product screening cost. H10b: Higher retailer learning is associated with higher consumer product evaluation cost.

1.10 Consumer Learning

We noted that consumer learning includes store knowledge and product knowledge, both representing important factors affecting the efficiency of the shopping activity. It has been observed that in traditional retail settings, knowledge about the layout of a retail store helps consumers easily and quickly locate the products they seek (Johnson et al., 2003; Kahn and McAlister, 1997).

With online purchasing, the physical store environment no longer exists, and the shopping experience is converted into a human–website interaction (Chen and Dubinsky, 2003). Griffith (2005) classified website layouts into two categories: tunnel structured, which constricts a consumer's movements through a website to predetermined paths, and tree structured, which allows consumers to move freely and access information easily. Vrechopoulos et al. (2004) applied this typology to the virtual setting and found that an online store's layout significantly affects consumer behavior, such as the length of time spent on the website. Consumer learning, again, plays an important role in helping consumers overcome these hurdles to online shopping.

H11: Higher consumer learning is associated with lower consumer product screening cost.

Consumers go through multiple stages to complete their shopping activity: need recognition, product brokering, purchase, delivery, and post sales service. The product brokering effort is typically comprised of two stages: a product screening stage and a product evaluation stage (Payne, 1982; Payne et al., 1988). Efficiency at each of these stages should have a positive impact on repurchase intention. Since lowering the cost of product screening and product evaluation results in higher online product brokering efficiency, and ultimately higher repurchase intention, we propose the following hypotheses.

H12: Lower consumer product screening cost is associated with higher repurchase intention. H13: Lower consumer product evaluation cost is associated with higher repurchase intention.

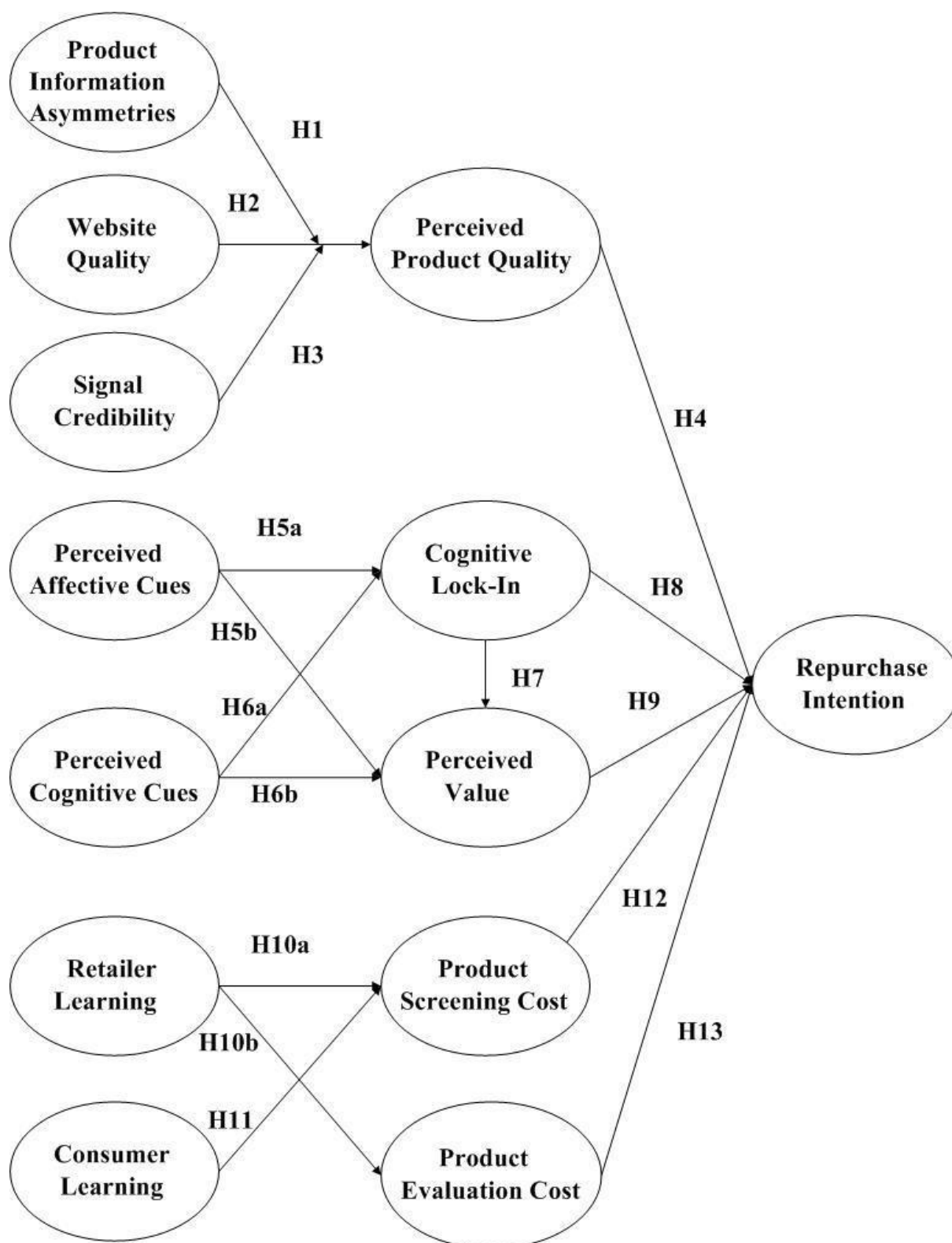


Figure 1. Conceptual model

2 Research Model and Hypotheses

2.1 Data collection and sample profile

The purpose of this study is to establish a model for estimating how each of the 13 constructs affects repurchase intention. Study subjects were those who had online shopping experience. Of the 223 questionnaires that were distributed, 198 were returned as valid. This study's effective sample size of 198 satisfies both thresholds. Of

the 198 respondents, 43.5% were male and 56.5% were female. In regards to age, 47 (23.50%) were younger than 19, 60 (31.00%) were in the 19–25 age group, 51 (25.500%) were in the 26–35 age group, 31 (15.50%) were in the 36–45 age group, and 9 (4.50%) were over 45 years of age. Among our respondents, 120 (60.0%) had graduated from college, 49 (25.5%) had post-graduate degrees, and 29 (14.50%) had a high school or equivalent vocational school diploma. The top three occupations represented amongst the respondents were students (83 respondents: 43.18%), service workers (23 respondents: 13.00%), and information workers (21 respondents: 10.50%).

2.2 Procedure

This research was reviewed and approved by the Institutional Research Board of the researchers' university. An online survey consisting of 39 items was developed for data collection. Prior to the formal administration, a pretest was administered to 5 recruits of different ages from the researchers' university. Minor problems in the research design were identified and items were revised, accordingly. The formal survey was administered individually at the participants' convenience, and the webpage for the online survey clearly explained the complete research procedure. Each participant spent from 10 to 15 minutes answering the online questionnaire. IBM SPSS Statistics 20 was used to analyze the data gathered in this study.

2.3 Instrumentation

The questionnaire included 13 sections of questions that were designed to measure the independent variables, dependent variables and basic information in this study. Each item was assessed on a 5-point scale anchored by 1 (strongly disagree) and 5 (strongly agree).

Confirmatory factor analysis was applied to detect the uni-dimensionality of each construct (Anderson & Gerbing, 1988). As illustrated in Table 1, all coefficient alpha estimates, ranging from 0.660 to 0.951, were >0.6 , and composite reliabilities were >0.6 . The results imply that all constructs comply with the requirement for high internal consistency (Fornell, 1992; Roberts & Wortzel, 1979). Content validity was established through a literature review and by consulting experienced researchers and managers. Construct validity was verified by convergent validity and discriminant validity. The following were checked to ensure convergent validity: (a) a factor loading of >0.5 between observed variables and a latent variable (Hair et al., 1998), (b) a composite reliability for a latent variable of >0.6 (Fornell, 1992), and (c) a t -value >1.96 for each of the measure items (Simonin, 1999). Since the statistics for this study (Table 1) met all these three checks, we conclude that the questionnaire used by this paper possesses convergent validity. Discriminant validity was verified using the confidence interval method by constructing a 95% confidence interval for correlation coefficient between two constructs. If the confidence interval does not include one, then the two constructs are judged to possess discriminant validity (Torkzadeh, Koufteros, & Pflughoeft, 2003). The discriminant validity of this study has been proven to fall within the confidence interval (± 1.96 standard errors) around the correlation estimates for the sixteen pairs of latent constructs, and does not include a value of one (Anderson & Gerbing, 1988).

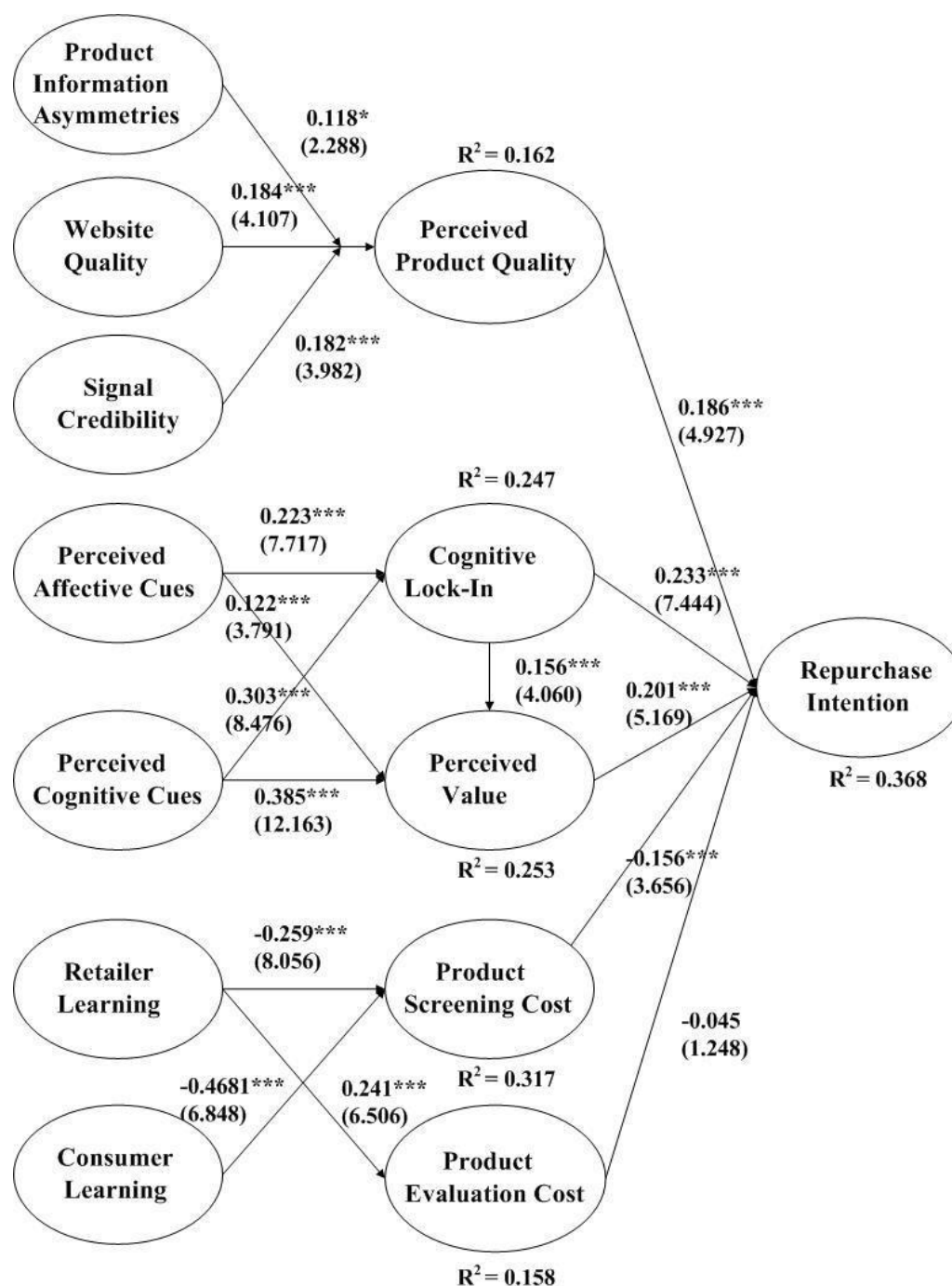


Figure 2. Revised Model

Construct	Items	Factor Loadings	Composite Reliability	AVE	Cronbach's Alpha
Product Information Asymmetries	PAI 1	0.613	0.955	0.703	0.951
	PAI 2	0.884			
	PAI 3	0.763			
Web Site Quality	WSQ 1	0.969	0.824	0.620	0.823
	WSQ 2	0.774			

	<i>WSQ 3</i>	0.569			
<i>Signal Credibility</i>	<i>SC 1</i>	0.802	0.951	0.683	0.949
	<i>SC 2</i>	0.804			
	<i>SC 3</i>	0.686			
<i>Perceived Product Quality</i>	<i>PPQ 1</i>	0.937	0.912	0.777	0.854
	<i>PPQ 2</i>	0.915			
	<i>PPQ 3</i>	0.784			
<i>Repurchase Intentions</i>	<i>RI 1</i>	0.787	0.861	0.674	0.758
	<i>RI 2</i>	0.868			
	<i>RI 3</i>	0.804			
<i>Perceived Affective Cues</i>	<i>PAC 1</i>	0.826	0.817	0.603	0.694
	<i>PAC 2</i>	0.617			
	<i>PAC 3</i>	0.865			
<i>Perceived Cognitive Cues</i>	<i>PCC 1</i>	0.841	0.871	0.692	0.783
	<i>PCC 2</i>	0.813			
	<i>PCC 3</i>	0.841			
<i>Cognitive Lock-in</i>	<i>CLI 1</i>	0.905	0.806	0.591	0.660
	<i>CLI 2</i>	0.818			
	<i>CLI 3</i>	0.535			
<i>Perceived Value</i>	<i>PV 1</i>	0.695	0.851	0.658	0.735
	<i>PV 2</i>	0.871			
	<i>PV 3</i>	0.855			
<i>Retailer Learning</i>	<i>RL 1</i>	0.926	0.938	0.834	0.900
	<i>RL 2</i>	0.935			
	<i>RL 3</i>	0.878			
Construct	Items	Factor Loadings	Composite Reliability	AVE	Cronbach's Alpha
Consumer Learning	CL 1	0.832	0.883	0.715	0.810
	CL 2	0.874			
	CL 3	0.831			
Product Screening Cost	PSC 1	0.876	0.918	0.788	0.866
	PSC 2	0.929			
	PSC 3	0.857			
Product Evaluation Cost	PEC 1	0.868			
	PEC 2	0.887			

PEC 3	0.723	0.868	0.688	0.767
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Table1. The reliability and validity analysis for the constructs.

2.4 Structural model and tests of hypotheses

Structural equation modeling (SEM) was used to estimate the parameters of the structural model. The completely standardized solutions computed by the Amos 17.0 maximum-likelihood method are reported in Table 2. As shown in Table 2, all fit measures in the structural model showed a reasonable fit to the data ($\chi^2(324) = 251.28$; d.f. χ^2 129; $\chi^2/\text{d.f.}$ 1.95; GFI χ^2 0.92; AGFI χ^2 0.89; CFI χ^2 0.98; RMSEA χ^2 0.05). The test results in Table 2 support the causal paths (H1, H2, H3, H4, H5a, H5b, H6a, H6b, H7, H8, H9, H10a, H10b, H11 and H12) and fail to support the remaining H13.

Hypothesis	Path	β -value	t-value	Support
H1	Product Asymmetries of Information(moderating) → Perceived Product Quality	0.118	2.288	Yes
H2	Web Site Quality → Perceived Product Quality	0.184	4.107	Yes
H3	Signal Credibility(moderating) → Perceived Product Quality	0.182	3.982	Yes
H4	Perceived Product Quality → Repurchase Intentions	0.186	4.927	Yes
H5a	Perceived Affective Cues → Cognitive Lock-in	0.223	7.717	Yes
H5b	Perceived Affective Cues → Perceived Value	0.122	3.791	Yes
H6a	Perceived Cognitive Cues → Cognitive Lock-in	0.122	3.791	Yes
H6b	Perceived Cognitive Cues → Perceived Value	0.122	3.791	Yes
H7	Cognitive Lock-in → Perceived Value	0.156	4.060	Yes
H8	Cognitive Lock-in → Repurchase Intentions	0.233	7.444	Yes
H9	Perceived Value → Repurchase Intentions	0.201	5.169	Yes
H10a	Retailer Learning → Product Screening Cost	-0.259	8.056	Yes
H10b	Retailer Learning → Product Evaluation Cost	0.241	6.506	Yes
H11	Consumer Learning → Product Screening Cost	-0.468	16.848	Yes
H12	Product Screening Cost → Repurchase Intentions	-0.156	3.656	Yes
H13	Product Evaluation Cost → Repurchase Intentions	-0.045	1.248	NO

Table 2. Structural parameter estimates and goodness-of-fit indices.

III. Discussion and Implications

The purpose of this study was to develop a model that explains repurchase intentions. The studies were conducted to assess website quality as a signal of product quality under varying levels of information asymmetries and signal credibility. This survey of customers of business-to-consumer (B2C) websites indicated that perceived value exerted a stronger influence on consumer intentions to shop online than did cognitive lock-in. We conceptualized and empirically tested the mechanism through which technological capabilities in the form of PPRs amplify the store loyalty of online customers.

Product information asymmetry (PIA) was investigated in this study and was found to moderate the effect of website quality (WSQ) on perceived product quality (PPQ), with this relationship being stronger when less product information was available (i.e., high PIA). In this study, signal credibility (SC) was found to moderate the relationship between website quality (WSQ) and perceived product quality (PPQ), with this relationship being stronger when subjects were told that a significant investment was required to build and maintain a commercial website (i.e., high SC). Our study demonstrated that PAI had both a main effect on PPQ, with higher levels of PAI resulting in lower PPQ, and a moderating effect such that WSQ has a greater effect on PPQ when consumers have less information about a product (i.e., higher PIA) as compared to more product information, as predicted. Our results also showed that PIA has a lesser impact on PPQ, depending upon WSQ. A website with high quality extrinsic cues can largely compensate for a lack of product information (intrinsic cues).

Gupta and Kim (2010) noted that perceived value exerted the strongest effect on purchase intentions in

online settings. The empirical results of this study showed cognitive lock-in as a key factor which increases consumers' perceptions of value and motivates online shopping behavior. The empirical results identified perceived affective cues and perceived cognitive cues as two significant determinants of perceived value, both seldom addressed in the literature. This study contributes to the extant literature by examining whether product cues cause cognitive lock-in effects on the relationship between consumers and B2C websites. The empirical results revealed that perceived affective cues influenced cognitive lock-in more strongly than did perceived cognitive cues. This finding suggests that delivering attractive, favorable and interesting product cues is more effective than delivering differential product cues for locking in consumers exposed to product stimuli.

IV. Conclusion

This study applied signaling theory to determine whether website quality was a potential signal of product quality. By using perceived product cues, perceived value, and cognitive lock-in to assess consumer purchase intentions in the context of B2C websites, this study found that, indeed, website quality does affect consumers' perceptions of product quality.

Future research will help identify the key factors that affect how consumers perceive and interpret website quality as a means for making product quality assessments when faced with high levels of information asymmetry. These findings provide a solid foundation for future investigations and practical insights for designing B2C e-commerce websites. This study also makes a contribution by addressing cognitive lock-in (Johnson, Bellman, and Lohse, 2003) and its effects on perceived value and purchase intentions. These insights not only help researchers better understand how PPRs influence consumers' shopping behavior in electronic markets, but also provide guidelines for online retailers to better adjust their IT strategies to improve customer retention.

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